(Un)intended consequences of female labor force participation

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1 Introduction

Violence against women is a universal problem. Thirty-five percent of women worldwide experience either physical and/or sexual intimate partner violence (IPV) or non-partner sexual violence in their lifetime (WHO). Though the social and economic costs of IPV are well studied, the literature on factors determining IPV is limited (Carrillo et al., 1992; Heise et al., 1994; Morrison & Orlando, 1999; Unicef et al., 2000). One factor explored by previous research is employment outside of the home. Labor force opportunities may increase women's empowerment while simultaneously incurring undesired behaviors from male partners who perceive the additional resources of women as threatening. This paper seeks to understand the long-term effect of female labor force participation rate (FLFP) on IPV while accounting for the important mediating role of women's empowerment, which complicates the relationship.

In this paper, I use an exogenous global labor shock to study the long-run causal effects of employment on IPV. Additionally, I explore socio-cultural mechanisms that affect both employment and IPV to develop a framework to study IPV using different geographic contexts. A worldwide trade shock (Agreement on Textiles and Clothing (ATC)) in the garment industry removed preferential quotas in developing countries. The ending of quotas increased competition in the industry which resulted in either increased or decreased production of garments that directly impacted women's employment in those industries. Given women's extensive engagement in the garment industry workforce, it can be said that an increase (decrease) in garment industries can be an exogenous positive (negative) shock for women's employment (Vivian & Miller, 2002).

The effects of labor force participation on domestic violence are mixed, and studies have found that these effects vary based on a woman's initial bargaining power (Heath, 2014). Additionally, evidence on the effect of women remaining in the labor force over the long-term is also missing in the literature. Increased exposure to labor markets is associated with increased empowerment which in turn has an impact on IPV, the question arises, is there an inverted U-shaped relationship between employment and IPV? Evidence from Colombia, suggests that at lower levels of employment, IPV increases with an increase in the employment rate, but it starts declining at medium to high levels of employment (Kadam & McCullough, 2020). The initial increase in IPV is consistent with previous research, but as employment increases, so does women's empowerment which in turn mediates and, in some cases, fully offsets, the effect of rising FLFP on IPV. The long-run effects of employment on IPV still remain unknown in several developing countries. In this paper, I estimate this relationship for 5 developing countries (Cambodia, Bangladesh, Dominican Republic, Colombia, and India).

I expect the findings to indicate that in the long run, rising empowerment completely offsets the initial negative impacts of employment on IPV, across all socioeconomic contexts. After instrumenting for employment, I expect to get an unbiased estimate of the relationship between employment and IPV which can be compared across countries.

2 Data and variables of interest

We multiple data sources consisting of socio-economic indicators for the outcome and treatment variables. Fist, I use individual level data collected from the Demographic and Health Surveys (DHS). This data comes from a nationally representative sample of women in 5 countries and contains same information across all the countries. The dataset includes information on women's employment status, incidence of IPV, and other women's characteristics. DHS surveys are conducted with all eligible women, aged 13-49 years. Eligible women include women that have been married at least once. This sample of ever-married women are women who self-report as being married, divorced, separated, or widowed, or living with or having ever lived with a man as if married. The Cambodia DHS does not follow the same household or individuals across surveys. Although DHS datasets were collected at regular intervals, each country varies in the collection period [1]. Using the DHS datasets, I create a pooled cross-sectional dataset for the years 1990-2015.

For the geographic locations, I use restricted and unrestricted data sources. For the DHS households, I use restricted geographic information to obtain geographic co-ordinates. Since the DHS does not provide the location co-ordinates for individual households due to confidentiality reasons, I use the co-ordinates for the DHS cluster. Households are reported within a 2 km radius of the DHS cluster co-ordinates. Lastly, I use the list of garment and textile factories registered with the Greater Manufacturers Association in Cambodia (GMAC) which includes factory name and location for all members. I estimate the geographic co-ordinates using the factory addresses and aggregate the number of factories in the big garment producing cities.

The treatment variable, FLFP, is constructed based on whether the woman is *Currently Employed*, which reflects a woman's participation in paid labor activities in the past 7 days, and also includes women who did not work in the past 7 days but who are regularly employed and were absent from work for leave, illness, vacation, or any other such reason. To define the level of exposure to garment factories, I create a measure of density of factories around the individuals home. I use the density of factories within a 100 km radius of a DHS cluster and interact it with the year post trade shock (2005). A DHS cluster is considered to be in a high density area if it lies in the top 25th percentile of the factory density distribution.

I classify the outcome variable according to its severity using three categories (Kishor & Johnson, 2004). The least severe category corresponds to a respondent reporting "being hit with the hand," "being hit

[1] These intervals vary for each country. In Cambodia, there are 3 surveys that include all the required variables for estimation. In Cambodia, DHS data on women's outcomes of IPV were collected in 2000, 2010, and 2014.

with an object," or "being pushed or shaken." The second category includes "being, dragged or kicked," "being strangled or burnt," and "being threatened by gun/knife or other weapon." The third category entails sexual violence, including "being physically forced into unwanted sex" and "being forced into other unwanted sexual acts." We also create an "any violence" indicator, which corresponds with the respondent reporting that she has experienced one or more of the above three violence categories. All the responses used for domestic violence are asked about the current husband/partner for currently married women, and the most recent husband/partner for divorced, separated, or widowed women. A "partner" is a man with whom the respondent lives with or lived with as if married.

3 Empirical Strategy

It is possible that increases in spousal violence can force women into the labor force, which makes women's employment endogenous to IPV. The endogeneity can stem from various sources. First, individual-level data may be prone to a problem of reverse causality. For instance, Bhattacharya (2015) find that in India, spousal violence is associated with higher likelihood of married women seeking employment outside the house. Fajardo-Gonzalez (2020) also finds that IPV increases women's participation in the labor force. Second, there are other unobservable factors such as social norms and cultural contexts that drive both the woman's decision to work, and the incidence of IPV from the husband. Lastly, (Aizer, 2010) finds that a bias in survey data from self-reported surveys. Given these problems, it is not possible to obtain causal inference around the effects of employment on IPV using OLS and the currently available data. In order to address the issue of endogeneity, I develop an instrumental variable (IV) approach to estimate causal effects of employment on IPV. Using an approach explained by Goldsmith-Pinkham et al. (2020), I discuss the conditions under which IV is identified and estimates local average treatment effects (LATE).

The instrumental variable (IV) is formed by interacting growth rate of the manufacturing sector (which is a proxy for policy size of the trade shock) with temporally varying measures of exposure to the garment industry. This IV must satisfy two main requirements. First, it must be correlated with women's employment. This can be statistically tested by rejecting the null hypothesis that the instrument is weak (which is tested with the F-stat Table 1). Second, the IV must not belong in the original model of equation (2). This exclusion restriction implies that the trade shock must affect IPV only through its effects on women's employment. This assumption is untestable, but I make a strong case for why this is likely to hold in this scenario.

The first stage estimation of IV regresses IPV on the trade shock and all the control variables-

$$FLFP_{it} = \beta_0 + \beta_1 After_t * HighDensity_{it} + \mathbf{X_{it}}\delta + \epsilon_{1it} \tag{1}$$

where, for individual i in time period t; $FLFP_{it}$ is the rate of female labor force participation, $After_t *$

$HighDensity_{it}$ is the interaction of time period after 2005 and high density; $\mathbf{X_{it}}$ is the vector of EA level controls including woman's age, education, spouse's employment, spouse's education; and ϵ_{it} is the normally distributed error term.

The second-stage uses the predicted employment from equation (2) to predict IPV as

$$Y_{it} = \beta_2 + \beta_3 FL\hat{F}P_{it} + \mathbf{X_{it}}\delta + \epsilon_{2it} \tag{2}$$

where for EA v in time period t, Y_{it} is the predicted IPV; $FLFP_{it}$ is the rate of female labor force participation; and other variables are similar to equation (1).

Assuming the validity of the instrument, employment status is exogenized and the coefficient β_5 measures the local average treatment effects (LATE) of increased participation of women in the labor force on IPV, i.e., the increase in incidence of IPV (as measured by the dependent variable) due to employment *in those EAs where the trade shock and change in density of factories induced a change in female employment.*

I discuss the validity of the IV with the two identifying assumptions that make the trade shock a good IV for FLFP. The first assumption is that trade shock and factory density are both highly correlated with FLFP. In Bangladesh, the end of the trade agreement lead to a 15 percent increase in number of garment factories between 2005 and 2010 which corresponded with a 63 percent increase in the number of women hired in the industry (Kagy, 2014). By 2013, 3.5 million people were hired in the garment industry, out of which 80 percent were female (BGMEA, 2013). Except for Pakistan, most countries are known to hire more women in the garment industry (Fukunishi et al., 2013). The other identifying assumption is that trade shock is uncorrelated with ϵ_{1it} from equation (1). Though this is untestable, I make a case that location of the boom (or bust) of the garment industry in the 5 countries was not dependent on women's outcomes in those countries. First, I compare maps of the major areas where the garment industry is located in all the countries. In figure 1, we can see that big cities in the respective countries tend to be hubs for the placement of garment industries. Second, I will conduct interviews with experts from the countries to find out whether there have been changes in the locations of the garment factories. From my interviews, I expect to find that the major hubs for the garment industries remain unchanged and are almost always major cities in all the countries. Lastly, it is likely that the placement of potential new factories was based on locations where women's decision-making power was already higher. I empirically test whether women's characteristics predict any changes in the number of factories by estimating the equation

$$(Factories_{2005} - Factories_{1999})_{it} = \alpha_0 + WomensOutcomes'_{it}\delta + \eta_v + AgeFE + \epsilon_{it} \tag{3}$$

where the outcome variable is the change in factories between 2005 and 1999; $WomensOutcomes'_{it}$ are women's decision making characteristics such as decision making ability, marital status, number of children, and education; AgeFE is age fixed effects, and other variables are as defined in equation 1.

4 Preliminary results from Cambodia

Table 1 shows the results from equations (1) and (2). The first column, shows results from simple OLS regression of IPV on employment, and other co-variates. Column (2) shows the first-stage IV results. These results are surprising because FLFP seems to be declining in time. Additionally, the coefficient on $afterDen$ is positive, which is the interaction of density and after trade shock. The F-statistic is high (41.60) thus we can claim that the instrument is not a weak instrument. Lastly, column (3) shows the second-stage effect of employment on IPV. An increase in employment is associated with a decrease in IPV, and this effect is statistically insignificant.

Table 2 shows results from a reduced-form regression of IPV on density after trade shock (Angrist & Pischke, 2008; Chernozhukov & Hansen, 2008). The coefficient on after trade shock is negative and significant but neither density nor density post trade shock are significant.

Figure 1 shows the location of the garment factories in Cambodia. The factories are concentrated in the Phnom Penh and the Kandal province, thus indicating that the factories are located near big city-hubs.

Table 1: Instrumental-variable results

Variables	OLS	IV-first stage	IV-second stage
emp	0.00137		-0.255
	(0.00916)		(0.386)
afterDen		-0.00271**	
		(0.00111)	
2.time		-0.123***	-0.063
		(0.0156)	(0.056)
3.time		-0.00891	0.007
		(0.0146)	(0.015)
density		0.00518***	0.000
		(0.000872)	(0.001)
wei	0.00828**	0.0382***	0.018
	(0.00332)	(0.00380)	(0.015)
v133	-0.00961***	0.00275*	-0.010***
	(0.00127)	(0.00154)	(0.002)
v012	-0.000878	0.00694***	0.001
	(0.000617)	(0.000742)	(0.003)
v201	0.0141***	-0.00815***	0.013***
	(0.00227)	(0.00272)	(0.004)
hsWork	-0.170***	-0.0108	-0.167***
	(0.0366)	(0.0401)	(0.047)
DadBt	0.126***	-0.0113	0.122***
	(0.0114)	(0.0140)	(0.015)
Constant	0.314***	0.463***	0.442**
	(0.0417)	(0.0470)	(0.193)
Observations	7,940	7,940	7,940
R-squared	0.037	0.047	
F test		41.60	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: OLS Estimation Results for the Reduced Form Relationship between Trade shock and IPV

	Dependent variable: Any domestic violence
	(1)
VARIABLES	OLS
afterDen	4.80e-05
	(0.00101)
after	-0.0253**
	(0.0115)
density	-0.00117
	(0.000841)
Constant	0.190***
	(0.00991)
Observations	8,194
R-squared	0.002

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

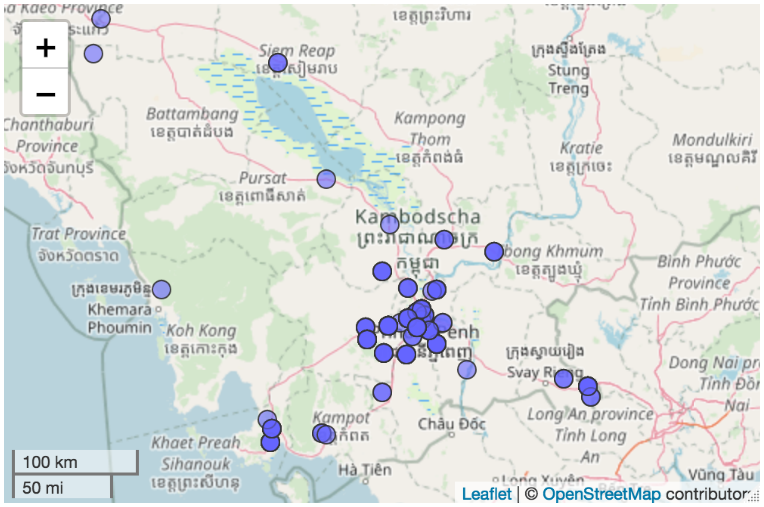

Figure 1: Factory locations in Cambodia

References

Aizer, A. (2010). The gender wage gap and domestic violence. *American Economic Review*, *100*(4), 1847–59.

Angrist, J. D., & Pischke, J.-S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton university press.

Bhattacharya, H. (2015). Spousal violence and women's employment in India. *Feminist Economics*, *21*(2), 30–52.

Carrillo, R., et al. (1992). Battered dreams: violence against women as an obstacle to development. *Battered dreams: violence against women as an obstacle to development.*.

Chernozhukov, V., & Hansen, C. (2008). The reduced form: A simple approach to inference with weak instruments. *Economics Letters*, *100*(1), 68–71.

Fajardo-Gonzalez, J. (2020). Domestic violence, decision-making power, and female employment in Colombia. *Review of Economics of the Household*, (pp. 1–22).

Fukunishi, T., Goto, K., & Yamagata, T. (2013). Aid for trade and value chains in textiles and apparel. *World Trade Organization, IDE-JETRO and the OECD, Paris*.

Goldsmith-Pinkham, P., Sorkin, I., & Swift, H. (2020). Bartik instruments: What, when, why, and how. *American Economic Review*, *110*(8), 2586–2624.

Heath, R. (2014). Women's access to labor market opportunities, control of household resources, and domestic violence: Evidence from Bangladesh. *World Development*, *57*, 32–46.

Heise, L., Pitanguy, J., & Germain, A. (1994). Violence against women: the hidden health burden. *World Bank discussion papers*, *255*.

Kadam, A., & McCullough, E. (2020). Employment, intimate partner violence, and women's empowerment in Colombia. *Working Paper*.

Kagy, G. (2014). Female labor market opportunities, household decision-making power, and domestic violence: Evidence from the Bangladesh garment industry. *Discussion Papers in Economics*, *9*.

Kishor, S., & Johnson, K. (2004). *Profiling domestic violence: A multi-country study*. MEASURE DHS+, ORC Macro.

Morrison, A. R., & Orlando, M. B. (1999). Social and economic costs of domestic violence: Chile and Nicaragua. *Too close to home: Domestic violence in the Americas*, (pp. 51–80).

Unicef, et al. (2000). Domestic violence against women and girls, innocenti digest (6). *Florence: UNICEF Innocenti Research Centre*.

Vivian, J., & Miller, C. (2002). *Women's employment in the textile manufacturing sectors of Bangladesh and Morocco*. United Nations Research Institute for Social Development.